

## GOAL 4

# HEALTHY COMMUNITIES AND ECOSYSTEMS

*Protect, sustain, or restore the health of people, communities, and ecosystems using integrated and comprehensive approaches and partnerships.*

To protect, sustain, or restore the health of communities and ecosystems, EPA must bring together a variety of programs, tools, approaches, and resources; create strong partnerships with federal, state, tribal, and local government agencies; and enlist the support of many stakeholders. Because Goal 4 is unique in its cross-media, cross-Agency approach, building a cohesive, integrated strategy is critical for achieving results.

EPA must manage environmental risks to watersheds, communities, homes, and workplaces to protect human health and the environmental integrity of ecosystems. The Agency will employ a mix of regulatory programs and alternative voluntary approaches to achieve results efficiently and in innovative, sustainable ways. For example, preventing pollution at the source is the preferred strategy for reducing risk and environmental impact. However, where programs to prevent pollution or ecosystem damage are not viable, EPA promotes waste minimization, avoidance of impact on habitat, and disposal and remediation. In managing risk, EPA will direct its efforts toward the greatest threats in our communities, homes, and workplaces, including threats to sensitive populations, such as children, the elderly, and Native Americans.

A key component of this goal is protecting human health and the environment by identifying, assessing, and reducing the risks presented by the thousands of chemicals on which our society and economy have come to depend. These include the pesticides used to meet national and global demands for food and the industrial and commercial chemicals found in products and throughout our homes and workplaces.

Some pest control methods used to ensure an abundant and affordable food supply can cause unwanted environmental or health effects. Apart from agriculture, effective pest control is also essential for homes, gardens, highways and utility lines, hospitals, and drinking water treatment facilities. Pesticides are an important part of pest management in each of these settings. Licensing pesticides helps to ensure that they can be used safely and beneficially while avoiding unintended harm to human health or environment. EPA must also address the emerging challenges posed by a growing array of biological organisms—naturally occurring and, increasingly, genetically engineered—that are being used in industrial and agricultural processes.

Building a community's capability to make decisions that affect the environment is at the heart of the community-centered work under this goal. EPA's Brownfields Program encourages community development through funding to inventory, assess, and clean up the hundreds of thousands of brownfields properties that have been abandoned or unused due to previous industrial, commercial, or other use. EPA's efforts to share information and build community capacity offer the public the tools it needs in considering the many aspects of planned development or redevelopment.

EPA's ecosystem protection programs encompass a wide range of approaches that address specific at-risk regional areas along with larger categories of threatened systems, such as estuaries and wetlands. Locally generated pollution, combined with pollution carried by rivers and streams and through air deposition, can collect in these closed and semi-closed ecosystems, degrading them over time.

Large water bodies, such as the Gulf of Mexico, the Great Lakes, and Chesapeake Bay, are surrounded by industrial and other development and have been exposed to substantial pollution over many years at levels higher than current environmental standards permit. As a result, the volume of pollutants in these water bodies has exceeded their natural ability to restore balance. Working with stakeholders, EPA has established special programs to protect and restore these unique resources by addressing their vulnerabilities. At the Mexican Border, for example, addressing local pollution and infrastructure are priorities for the Mexican and the U.S. governments under the Border 2012 agreement. Safe drinking water is a particular priority. Coastal estuaries and wetlands are also vulnerable. As the population in coastal regions grows, the challenges to preserve and protect these important ecosystems increase. Coastal areas are testing grounds for combining innovative and community-based approaches with national guidelines and inter-agency coordination to achieve results.

Children and the elderly face significant and unique health threats from a range of environmental exposures. Pound for pound, children breathe more air, drink more water, and eat more food than adults, and their behavior patterns may increase their exposure to potential toxics. Because their systems are still developing, children may be more vulnerable to environmental risks, including air pollution that may exacerbate asthma, lead-based paint in older homes, microbes that may be resistant to treatment in drinking water, and persistent chemicals that may cause cancer or induce reproductive or developmental changes.

Due to the normal decrease in biological capacity that accompanies the aging process, even older Americans in good health may be at increased risk from exposure to environmental pollutants. As people age, their bodies are less able to detoxify and eliminate toxins. Native Americans represent another segment of the population with a different risk profile. Their traditional foods and ways of life may lead to higher levels of exposure to certain toxics. EPA will focus on these sensitive populations by increasing our understanding of these issues, building infrastructure and capacity, and providing

information and tools needed to assess and prevent adverse impacts.

All of EPA's activities will rely on the latest and best scientific information. Sound science must be the basis of standard-setting and guide us in identifying and addressing emerging issues, as well as updating and advancing our understanding of long-standing human health and environmental challenges. Goal 4 includes a substantial amount of the Agency's scientific research. In this *Strategic Plan*, research directed toward achievement of a particular environmental outcome has been included under the goal with which it is associated. However, EPA conducts much of its research to learn more about broad areas of protecting human health and the environment. The contribution of such research can advance many of the Agency's programs and might do so in unpredictable ways. This research—not directly linked to any single environmental outcome—is described under Goal 4. To help us focus our resources most effectively, EPA will also continue directing research under Goal 4 to improve its development and use of environmental indicators.

## OBJECTIVES

**Objective 4.1: Chemical, Organism, and Pesticide Risks.** Prevent and reduce pesticide, chemical, and genetically engineered biological organism risks to humans, communities, and ecosystems.

**Sub-objective 4.1.1: Reduce Exposure to Toxic Pesticides.** Through 2008, protect human health, communities, and ecosystems from pesticide use by reducing exposure to the pesticides posing the greatest risk.

### Strategic Targets:

- ▼ Through 2008, systematically review pesticides in the marketplace to ensure that they meet the most current safety standards: reregistration (100 percent by 2008) , tolerance reassessment (100 percent by 2006), and registration review (12 percent by 2008, based on 15-year review cycle for all registrations).
- ▼ Each year through 2008, protect endangered and threatened species by ensuring that none of the 15 species on the EPA/Fish and Wildlife Service (FWS)/U.S. Department of Agriculture (USDA) priority list of threatened or endangered species will be jeopardized by exposure to pesticides.
- ▼ By 2008, reduce by 30 percent the number of mortalities to nontargeted terrestrial and aquatic wildlife caused by pesticides compared to 1995 levels of 80 reported bird incidents and 65 reported fish incidents (3-year average

1994-1996). (Baseline: 15 percent reduction by 2006 )

- ▼ Through 2008, develop 10 (cumulative total) biogeographical modules which enable the Agency to factor unique tribal pesticide exposure scenarios into all appropriate pesticide reviews. (Baseline: pilot of 2 modules in FY 2003; total number of modules to be determined, 16-18 current estimate.)
- ▼ By 2008, decrease by 30 percent the occurrence of residues of carcinogenic and cholinesterase-inhibiting neurotoxic pesticides on foods eaten by children from their average 1994-1996 levels. (Baseline: 15 percent reduction as of 2006)
- ▼ By 2006, reduce by 10 percent the reregistration decision time, from the initiation of public participation to the signed Reregistration Eligibility Decision, compared to the FY 2002 baseline of 30 months.
- ▼ By 2008, reduce by 20 percent the inventories of obsolete persistent organic pesticides from the key source countries of Russia and Mexico<sup>1</sup> (i.e., those pesticides with the greatest potential for contributing to long-range environmental transport to the United States). (2003 baseline of over 21,000 tons for the Russian Federation; 2001 baseline of 1,151 tons for Mexico)

**Sub-objective 4.1.2 License Pesticides Meeting Safety Standards.** Through 2008, protect human health, communities, and ecosystems from pests and disease by ensuring the availability of pesticides, including public health pesticides and antimicrobial products, that meet the latest safety standards.

Strategic Targets:

- ▼ By 2008, at least 11 percent of acre treatments<sup>2</sup> will use applications of reduced-risk pesticides. (Baseline: 3.6 percent in 1998.)
- ▼ Each year through 2008, expedite the registration of 4 to 6 new active ingredients which meet the criteria for reduced-risk pesticides or organophosphate alternatives to make safer pest management tools available sooner. (Expedited registration time is 24 months versus the standard 40 months.) (Baseline: In 2002, 4 expedited registrations were done for reduced-risk conventional active ingredients.)



- ▼ By 2008, reduce registration decision times by 10 percent for conventional new active ingredients and 5 percent for reduced-risk new active ingredients from the 1995-2002 baseline of 40 months for conventional new active ingredients and 24 months for reduced-risk conventional new active ingredients.
- ▼ Each year through 2008, ensure new pesticide registration actions (including new active ingredients, new uses) meet new health standards and are environmentally safe. (In 2002, there were registration actions for 26 active ingredients and 720 new uses.)
- ▼ Each year through 2008, maintain the timeliness of Section 18 emergency exemption decisions (2002 baseline of 35 days).

**Sub-objective 4.1.3: Reduce Chemical and Biological Risks.** Through 2008, prevent and reduce chemical and biological organism risks to humans, communities, and ecosystems.

Strategic Targets:

- ▼ Through 2008, eliminate or effectively manage risks associated with High Production Volume (HPV) chemicals identified as priority concerns through EPA's assessment of Screening Information Data Set and other information.<sup>3</sup>
- ▼ Through 2008, complete risk assessments for at least 10 chemicals to which children may be exposed to enable effective management of identified risks. (Baseline is 0 chemicals with completed risk assessments in FY 2003)
- ▼ Through 2008, increase the efficiency of EPA's efforts to eliminate or effectively manage risks associated with HPV chemicals and chemicals to which children may be exposed by employing collaborative strategies with chemical producers and users and leveraging strategies with other governmental entities upon initial identification of such risks. Efficiency will be measured in terms of EPA's per-chemical review costs compared to 2005.
- ▼ Each year through 2008, prevent the introduction of new chemicals or organisms into commerce which pose unreasonable risks to workers, consumers, or the environment, through review of Pre-Manufacture Notifications (PMNs), and disapproval as necessary. (Baseline to be developed in FY 2004)<sup>4</sup>

- ▼ Through 2008, increase the efficiency of EPA's efforts to prevent the occurrence of new unreasonable human health and environmental risks associated with the entry of new chemicals into U.S. commerce by training chemical developers to use EPA's risk screening tools early in research and development, so that the Agency receives at least 40 pre-screened PMNs per year. Efficiency will be measured in terms of EPA's per-chemical review costs compared to 2002. (Baseline to be developed in FY 2004 for number of PMNs)<sup>5</sup>
- ▼ Through 2008, reduce relative risks to chronic human health associated with environmental releases of industrial chemicals in commerce by 7 percent from 2001 levels, as measured by EPA's Risk Screening Environmental Indicators model.<sup>6</sup>
- ▼ By 2008, establish short-term exposure limits for 75 percent of the chemicals identified as highest priority by the Acute Exposure Guideline Levels (AEGL) Program. (Baseline is 0 chemicals with AEGL values in 1996. There are approximately 240 chemicals on the highest priority list.)
- ▼ Through 2008, reduce the number of childhood lead poisoning cases to 90,000, from approximately 400,000 cases in 1999/2000.<sup>7</sup>
- ▼ By 2008, the health risks associated with air pollution from leaded gasoline use in numerous countries will be mitigated by eliminating the use of leaded gasoline worldwide.
- ▼ Through 2008, reduce the potential for risks from leaks and spills by ensuring the safe disposal annually of 9,000 large capacitors and 5,000 transformers containing polychlorinated biphenyls (PCBs). (Current information for the last 3 years for which data are available [1999-2001] indicates a downward trend in PCB disposal. In 2001, there were 9,494 large capacitors and 4,885 transformers safely disposed.)<sup>8</sup>
- ▼ By 2008, reduce by 20 percent the inventories of PCBs in Russia that have the greatest potential for contributing to the long-range environmental transport of these pollutants to the United States. (2000 baseline is 35,000 tons)<sup>9</sup>
- ▼ By 2008, decrease releases of persistent bioaccumulative toxic (PBT) chemicals by 15 percent and toxic chemicals (including dioxin) by 10 percent as

reported in the Toxic Release Inventory (TRI), compared to 2001 levels.  
(Baseline: 462,635,529 pounds of PBT chemicals and 5,744,530,557 pounds of all other toxic chemicals, including 328 pounds of dioxin)

**Sub-objective 4.1.4: Reduce Risks at Facilities.** Through 2008, protect human health, communities, and ecosystems from chemical risks and releases through facility risk reduction efforts and building community infrastructures.

Strategic Targets:

- ▼ By 2008, 30 percent of those facilities with hazardous chemicals, including Risk Management Plan facilities, will have reduced their risk of a major chemical accident out of a universe of approximately 15,000 facilities. (This includes reducing inventories of chemicals; reducing chemical accidents; improving chemical processes; replacing hazardous chemicals used in a process to a less hazardous chemical; and reducing vulnerability zones surrounding the chemical facility.)
- ▼ By 2008, 50 percent of local communities or Local Emergency Planning Committees (LEPC) will have incorporated facility risk information into their emergency preparedness and community right-to-know programs out of a universe of approximately 3,200 LEPCs.

## **Means and Strategies for Achieving Objective 4.1**

Chemicals, microorganisms, and pesticides can pose risks to individuals, communities, and ecosystems. Under this objective, EPA aims to prevent or significantly reduce these risks by:

- ▼ Identifying and assessing potential risks from chemicals, pesticides, and microorganisms
- ▼ Setting priorities for addressing these risks
- ▼ Developing and implementing strategies aimed at preventing risks and managing those risks that cannot be prevented
- ▼ Implementing regulatory measures, such as systematic review of pesticides and new chemicals, and developing and implementing procedures for safe production, use, storage, and handling of chemicals, pesticides, and microorganisms
- ▼ Employing innovative voluntary measures, such as promoting the use of reduced-risk pesticides and challenging companies to assess and reduce chemical risks and develop safer and less polluting new chemicals, processes, and technologies



- ▼ Conducting outreach and training and establishing partnerships
- ▼ Reducing or eliminating risks from potential chemical releases.

In coordination with our state and tribal co-regulators and co-implementors and with the support of industry, environmental groups, and other stakeholders, EPA will use these approaches to address risks associated with chemicals and pesticides. Improving communities' ability to address local problems is a critical part of our efforts to reduce risk.

## **Reducing Exposure to Pesticides**

Pesticides are essential for controlling insects, weeds, bacteria, and other pests on farms and in homes, gardens, and hospitals. It is estimated that pesticides are used on more than 1 million farms and in 90 million households.<sup>10</sup> These products are regulated and held to safety standards prescribed by the Federal Insecticide, Fungicide, and Rodenticide Act.

### Exposure to Pesticides in Food

People can be exposed to pesticides through their food. EPA is working to reduce this exposure, particularly to the more toxic pesticides. One of our priorities is to review older pesticides in light of Food Quality Protection Act (FQPA) safety standards. We will complete pesticide reregistration eligibility decisions by 2008 (food use by 2006) and, in tandem with that work, meet our FQPA statutory goal of reassessing the 9,721 existing tolerances by August 2006.

FQPA added cumulative, aggregate, and other new risk assessment requirements for reviewing pesticides and provided for EPA to establish a program to review pesticides on a 15-year cycle.<sup>11</sup> As the reregistration program draws to a close, this registration review program will ensure that pesticides in the marketplace continue to meet the most current FQPA safety standards. The cyclical registration review program will allow EPA continually to apply new science and risk criteria to ensure that risk evaluation and risk management information remain current. These changes will help to reduce the risks posed by newly licenced pesticides in food and the risks of exposure that workers, farm families, and vulnerable populations may face.

We will continue to improve our processes to reflect lessons learned, additional information from scientific advances, more sophisticated methods and tools, and identification of new risks or benefits. For example, the use of biotechnology to improve crops' agricultural qualities is an accelerating trend, which is producing an array of new and unique products, including genetically engineered plants and microorganisms. EPA will continue to work closely with USDA and the Food and Drug Administration to ensure the safety of the food supply and to identify additional scientific reviews or data that may be needed for these products.

### Other Exposures

Pesticide and pest control issues extend beyond the farm. Public health officials and homeowners use pesticides to control a variety of pests, protect human health, and benefit consumers. EPA registers antimicrobials used by public drinking water treatment facilities and by food processing plants and hospitals to disinfect surfaces. Effective antimicrobials are of growing importance as many serious disease-causing organisms become resistant to antibiotic procedures. To provide environmental, public health, and economic benefits, we will continue to work to make new pesticides available and to address emergency health or pest damage issues flexibly and efficiently.

EPA is also working to protect employers, applicators, handlers, and the public from the potential dangers posed by pesticides by implementing certification and training and worker protection programs. The Agency conducts outreach and education on using pesticides properly as well as implementing risk mitigation measures spelled out during the pesticide licensing process.

Since pesticide use also affects ecosystems, our reviews consider impacts to water resources, soil, and wildlife to prevent unreasonable harm. For example, EPA is collaborating with FWS and the National Marine Fisheries Service to improve our efforts to protect endangered species. We will be working to identify changes to existing policies, regulations, and the regulatory processes that will enhance protection of endangered species with minimal impact on food producers and pesticide users.

Outreach, training, and partnerships will play an integral role in meeting our goals. Providing information on alternatives for pest control, translating materials into other languages for nonnative speakers, and emphasizing the importance of following pesticide labels will help to reduce risks associated with using pesticides in and around the home. In addition, to complement ongoing outreach to reduce use of the riskier pesticides, our TRI program will develop a voluntary program with pesticide manufacturers, processors, and certain users.

Finally, because international sources of pesticides are also a concern, the Agency will work to promote a better understanding of the impact of pollutants from other countries and regions on the United States, and the impact of U.S. emissions on other countries. We will reduce pollution sources abroad through outreach, pollution prevention, and capacity-building measures, such as cost-effective and appropriate technology transfer.

## Reducing Risks from Chemicals and Microorganisms

### Screening, Assessing, and Reducing Risk

EPA's strategy to prevent and reduce risks posed by chemicals and microorganisms consists of three primary approaches: (1) preventing the introduction of chemicals and organisms that pose unreasonable risks into U.S. commerce; (2) effectively screening the stock of chemicals already in use for potential risk; and (3) developing and implementing action plans to reduce the use of and exposure to chemicals that have been demonstrated to harm humans and the environment. EPA intends to work with states and tribes, other federal agencies, the private sector, and international entities to implement this strategy and, in particular, to make protecting children and the elderly a fundamental goal of public health and environmental protection.

The Toxic Substances Control Act (TSCA) requires that EPA review all new chemicals and organisms prior to their production or import and be notified of significant new uses for certain chemicals that have already been reviewed.<sup>12</sup> EPA's PMN review typically assesses 1,500 to 2,000 new chemicals and organisms every year, a rate expected to continue through 2008. While TSCA gives EPA a 90-day review period, new criteria, such as preventing the introduction of PBTs or considering the use of new chemicals as potential weapons of terror, continue to emerge. An expanded set of screening tools will increase EPA's and industry's efficiency by using the data that companies provide in their PMN submissions to predict potential hazards, exposures, and risks quickly and effectively. Tools include the PBT Profiler and other models that estimate the fate and concentrations of chemicals released to the environment, including chemicals that may be released from consumer products, and models to estimate workplace exposures.<sup>13</sup> These tools will be critical for meeting the zero-tolerance standard implicit in our 2008 strategic target for these reviews.

Such tools are also a critical component of EPA's sustainable futures strategy to discourage development of potentially risky new chemicals at the earliest stages of product, process, and service design. The Sustainable Futures-P2 Framework initiative<sup>14</sup> provides chemical manufacturers with the same screening tools that EPA uses to evaluate potential risks to workers and the public and possible impacts to the environment. Over the next several years, the Agency will provide these tools and training to companies, enabling them to design and develop safer, less risky chemicals. Under the current pilot project, participating companies will be offered expedited review of their qualifying chemicals, which will allow manufacture to begin 45 days earlier. The intense interest expressed thus far suggests that this will be a powerful incentive for many companies to conduct their own hazard/risk screening. Effective use of these tools by companies that submit PMNs should decrease the number of problematic PMNs submitted to EPA.

Organisms will continue to pose new challenges to the review program. EPA has reviewed a

number of proposed microbial products that posed risks to humans and/or the environment because of genes introduced into the bacteria (for traits such as antibiotic resistance and/or altered metabolic pathways) or because of inherent pathogenicity associated with the parent microorganism. In 2002, for example, the Agency issued a proposed Significant New Use Rule covering at least eight microorganisms that, if used improperly, can be fatal to individuals with cystic fibrosis. Newly developed risk evaluation procedures will address exposure and hazard profiles for an increasing number of organisms we have never before encountered.

By 2008, EPA will make substantial progress in screening, assessing, and reducing risks posed by the 66,600 chemicals that were in use prior to the enactment of TSCA.<sup>15</sup> Thousands of these chemicals are still used today, and nearly 3,000 of them are HPV chemicals, produced or imported into the United States in quantities exceeding 1 million pounds per year. More than 300 companies and 101 consortia are voluntarily providing data that EPA will make publicly available and screen for potential hazards and risks. We will then identify and set priorities for further assessment and determine whether future action is necessary to eliminate or effectively manage the risks identified. To support these efforts, we will draw on data already obtained through the TSCA Inventory Update Rule, particularly on new exposure-related data to be provided beginning in 2005.

EPA is also working to complete detailed risk assessments of at least 10 chemicals to which children may be disproportionately exposed. The Agency is using a new strategy under which companies' assessments are submitted to an outside peer consultation panel composed of national experts in chemical risk assessment. In consultation with stakeholders, EPA had determined that an independent, scientifically rigorous review of the assessments was essential to ensure a process that could be recognized as impartial and of significant technical merit and value. EPA will also continue to identify and reduce the risks associated with other chemicals and classes of chemicals already in commerce.

By 2008, the broader risk screening and data assessment to be conducted through these efforts will provide a much better knowledge base from which to assess and reduce chemical risks. The chemical risk information developed under this goal is critical to EPA's success in achieving its other goals, providing the basis for virtually all chemical risk assessments that support EPA's air, water, and waste programs. The Agency will work to increase the availability of useful health and environmental information, including information about toxic releases, tools to increase access to and analysis of TRI data, and incentives for source reduction by facilities that report to TRI.

#### Protecting First Responders

In the event of a chemical emergency, protecting first responders or other on-site personnel is critical. Many chemicals that pose a potential threat emit toxic fumes, are toxic when in contact with

skin, or present other direct effects. To increase the Nation's preparedness, EPA, in collaboration with other federal, private, and academic organizations, is increasing the pace for developing AEGLs.<sup>16</sup> These guidelines are short-term exposure limits, representing three tiers of health effect endpoints (i.e., discomfort, disability, and death) for five different exposure durations. EPA will provide emergency personnel with information they need to take necessary precautions and treat individuals who may be on the scene.

### Addressing Lead and High-Risk Chemicals

In certain instances, risk-reduction efforts are targeted at specific chemicals. Foremost among these is the federal government's commitment to eliminate the incidence of childhood lead poisoning. Since 1973, we have reduced environmental lead levels by phasing out leaded gasoline and addressing other sources of exposure. Since the 1990s, EPA has focused on reducing children's exposure to lead in paint and dust through a regulatory framework, through federal interagency collaboration, and by educating parents and the medical community about prevention.

As a result of these efforts, in the United States, children's blood-lead levels have declined nearly 90 percent since the mid-1970s, and the incidence of childhood lead poisoning has declined from 900,000 cases in the early 1990s to approximately 400,000 cases in 1999-2000.<sup>17</sup> EPA will collaborate with industry and other federal agencies on a campaign to increase lead-safe work practices in home renovation and remodeling and to improve handling of lead paint on buildings and structures through market-based incentives and other innovative approaches.

On the international front, EPA is working to eliminate the use of leaded gasoline, which is responsible for up to 95 percent of airborne lead particles globally. We have succeeded in reducing the use of leaded gasoline internationally from 1993 to 1997 by two-thirds, from 249 million metric tons to 166 million metric tons.<sup>18</sup> EPA has formed partnerships with international and regional groups, such as the World Bank, the World Health Organization, the Asian Development Bank, the National Safety Council, and the Alliance to End Childhood Lead Poisoning. By leveraging resources from other U.S. government agencies, including the U.S. Agency for International Development, the U.S. Department of State, and the Centers for Disease Control we have established on-the-ground technical assistance projects in several parts of the world. The *Implementer's Guide to Lead Phase-Out*, an important technical-assistance tool, outlines fundamental policy, technical, and operational elements that will help countries manage the transition to unleaded gasoline.<sup>19</sup>

EPA is employing a multimedia, cross-Agency strategy to focus on other high-risk chemicals and classes of chemicals. For example, we are working to prevent new PBTs from entering commerce and to reduce risks associated with PBTs—including mercury—that are currently in use or have been used in the past. New information to be developed through the Dioxin Reassessment will support

strategies for reducing exposure to this dangerous class of chemicals. Recommendations to be provided to EPA in 2003 and 2004 from a panel of national experts on asbestos will assist the Agency in designing strategies to address asbestos risks. We will expand successful pilots to encourage companies to retire from service large capacitors and transformers containing PCBs to meet ambitious new targets for safe disposal by 2008. Because these chemicals represent various levels and exposure pathways, data sets are often uneven. Through 2008, therefore, EPA intends to examine possible measurement opportunities to better track the environmental and human health results of our high-risk chemical programs.

Long-range and transboundary atmospheric transport and deposition of persistent organic pollutants and other PBTs, such as mercury, are a continuing threat to human health and the ecosystems in North America. These pollutants can be transported and released far from their sources, enter the ecosystem, and bioaccumulate through the food chain. EPA believes that to reduce the recognized risks these pollutants pose to the American public, we will need to address their international sources. For example, we can most immediately reduce the risks posed by PCB emissions by cooperating with appropriate domestic and international partners to reduce existing stockpiles of equipment that generate these emissions and providing needed technical assistance and capacity building.

### **Reducing Risks at Facilities**

To reduce or eliminate the risks associated with chemical releases, EPA must first identify and understand potential chemical risks and releases. During 2003 and 2004, EPA will review and analyze data it has already collected, as well as the information it will receive under the Agency's Risk Management Plan program. This analysis will provide information on the geographic locations and facility types with the greatest potential for chemical accidents and releases. Additionally, EPA will identify areas where susceptible and sensitive populations may be at higher risk from chemical releases. EPA will also use information generated by other Agency efforts, such as the Emergency Planning and Community Right-to-Know Act and the Spill Prevention Control and Countermeasure program, to supplement data on potential chemical risks and to develop voluntary initiatives and activities aimed at high-risk facilities and/or geographic areas.

The majority of this work will be accomplished through our partnerships. EPA will work with communities to provide chemical risk information on local facilities. The Agency will also assist states and communities in understanding how these chemical risks could affect them and how to reduce those risks and prepare to address and mitigate risks should a chemical release occur.

**Objective 4.2: Communities.** Sustain, clean up, and restore communities and the ecological systems that support them.

**Sub-objective 4.2.1: Sustain Community Health.** By 2008, 220 U.S. communities, working with EPA, will adopt and begin to implement environmental planning and management processes for sustaining local ecosystems and pursuing ecologically compatible development. (2002 baseline of 0 communities) On the international front, EPA will work with selected trading partners to address potential sources of environmental degradation associated with trade-related development. All trade agreements negotiated between 2003 and 2008 will contain environmental protection provisions and commitments to enforce environmental laws and regulations effectively.

**Sub-objective 4.2.2: Restore Community Health.** Through 2008, facilitate the restoration of communities impacted by environmental problems. By 2008, increase by 50 percent the number of communities, working with EPA, that have addressed disproportionate environmental impacts and risks through comprehensive, integrated planning and environmental management, compared to the 2002 baseline of 30 communities.

**Sub-objective 4.2.3: Assess and Clean Up Brownfields.** By 2008, provide funding to eligible grant recipients, and, working with our state and tribal partners, assess and promote the cleanup and reuse of 9,200 brownfields properties, leveraging 33,700 jobs and \$10.2 billion in cleanup/redevelopment funding. (Second quarter FY 2003 baselines are 4,300 properties assessed, 24,900 jobs leveraged, and \$5.0 billion leveraged.)

**Sub-objective 4.2.4: Sustain and Restore U.S.-Mexico Border Ecosystems.** In the U.S.-Mexico Border Region, sustain and restore community health and preserve the ecological systems that support them.

Strategic Targets:

- ▼ By 2012, assess significant shared and transboundary surface waters and achieve a majority of water quality standards currently being exceeded in those waters. (The baseline is the shared and transboundary surface waters as defined, identified, and evaluated for the United States in the Clean Water Act §305(b) reports and for Mexico by the Secretariat for the Environment and Natural Resources.)
- ▼ By 2005, protect the health of 1.5 million people in the Mexico border area by

providing adequate water and wastewater sanitation systems funded through the Border Environmental Infrastructure Fund. (Cumulative.) (1998 Baseline: 0 additional people provided with access to potable water and wastewater collection and treatment systems; estimated 2002 baseline of 790,000 persons provided with access.)

## **Means and Strategies for Achieving Objective 4.2**

People often feel most closely connected to the environment in their communities, where they experience first-hand the benefits of safe drinking water, clean air, and healthy lakes, streams, and rivers that are safe for swimming and fishing. Decisions are made every day at the local level that affect air and water quality, habitat and biodiversity, and land use. For example, transportation and land-use planning, water supply and treatment, and waste management are all primarily local activities, and community decisions can either systematically advance clean air, clean and safe water, and restored and preserved land or can incrementally chip away at these goals. Because healthy, sustainable communities are the components of a healthy, sustainable country, EPA is committed to sustaining and restoring community health and the ecological systems that support it.

EPA will work in partnership with states and tribes, local governments, community groups, and other stakeholders to protect and sustain healthy communities and local natural resources. The Agency will work to restore the health of communities that are vulnerable to environmental impacts—for example, by addressing environmental justice issues and cleaning up and redeveloping brownfield sites. EPA will also develop stronger partnerships in communities, such as those along the U.S.-Mexico Border, that can influence neighboring jurisdictions.

### **Sustaining Healthy Communities**

One of the most important strategies for achieving healthy communities and ecosystems is protecting and sustaining natural resources that are at risk. EPA will use four approaches to facilitate community-based protection of local natural resources.

First, EPA recognizes its important role in supporting local resource protection by serving as a primary source of information about new community assessment and planning tools, the latest research, and examples of what other communities are doing to address similar issues. To better inform local decisionmaking, EPA will continue to improve methods for information exchange and access to environmental data and information at the community level.

Second, we will strive to build local capacity by developing and distributing tools that integrate



media-specific information; supporting multimedia planning; and developing training for local agencies and community groups on how to use data, information, and tools effectively in environmental assessment and planning and how to work collaboratively and cooperatively with a range of stakeholders. EPA will continue to identify and provide opportunities for public participation in environmental decisionmaking.

Third, the Agency recognizes that real-world, on-the-ground successes often galvanize neighboring communities into adopting integrated, comprehensive approaches to environmental management. Therefore, EPA will continue to facilitate local successes by providing technical and financial assistance directly to communities and by helping them coordinate environmental management processes and develop strategic partnerships. As a result of ongoing Administration efforts to negotiate international free trade agreements, our assistance to communities also extends to specific trading partners. In this context, EPA will undertake the environmental reviews and technical assistance necessary to promote ecologically compatible development.

Finally, EPA will work to ensure that national policies and programs support, rather than hinder, comprehensive, integrated local resource management. To this end, EPA will review new policies and regulations to ensure that programs are compatible and promote overall environmental improvement. The Agency will work to integrate existing programs to optimize their impacts and make them more compatible with local processes. In addition, EPA will partner with other federal agencies and national standard-setting organizations to create incentives for and remove barriers to smart growth and integrated environmental management.

### **Restoring Healthy Communities: Environmental Justice**

“Environmental justice” is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA works to integrate environmental justice into all aspects of the Agency’s programs and to promote constructive engagement and collaborative problem-solving among all stakeholders, especially in communities that have been disproportionately exposed to environmental hazards and risks.

EPA will continue to manage the Environmental Justice Community Small Grants program, which provides seed money to assist community-based organizations that are working to develop solutions to local environmental issues and to learn more about exposure to environmental hazards and risks and, consequently, protect their families and their communities.

The National Environmental Justice Advisory Council was created specifically to provide an Agency forum for communities disproportionately impacted by hazardous risks. The council’s six

subcommittees (Air/Water, Enforcement, Health/Research, Indigenous People, International, and Waste/Facility Siting) will continue to address the implications of multiple sources of environmental degradation on the health of communities and to develop recommendations for the Agency.

EPA will also continue to chair the Interagency Working Group (IWG) on Environmental Justice, which is composed of 11 federal departments and agencies, as well as White House offices. The IWG will collaborate with all levels of government and with the private sector to address the environmental, health, economic, and social challenges facing our communities. One tool will be demonstration and revitalization projects that focus attention on diverse urban and rural communities.

Training is essential to foster the integration of environmental justice into federal programs, policies, and activities. EPA's Fundamentals Workshop on Environmental Justice aids in training Agency employees and external stakeholders. By 2005, the Agency will add modules that promote consideration of environmental justice issues in permitting under the Resource Conservation and Recovery Act, the Clean Water Act, and the Clean Air Act. In addition, EPA will be expanding a 2002 pilot that emphasized training and multi-stakeholder partnering to increase Agency and community capacity to address issues through alternative dispute resolution.

### **Assessing and Cleaning Up Brownfields**

Brownfields are defined (with certain exclusions) as real properties, where expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Brownfields include abandoned industrial and commercial properties, drug labs, mine-scarred land, and sites contaminated with petroleum or petroleum products. EPA will continue to provide for the assessment and cleanup of these properties, leverage redevelopment opportunities, preserve green space, clarify liability, and offer job training.

The Small Business Liability Relief and Brownfields Revitalization Act, signed into law in 2002, expands federal grants for assessment, cleanup, and job training. To encourage revitalization and reuse of brownfield sites, the law limits the legal liability related to brownfield properties. In addition, the law provides for establishing and enhancing state and tribal response programs, which play a critical role in successfully cleaning up and revitalizing brownfields.<sup>20</sup>

Brownfields grants will continue to provide several types of support to communities. Brownfield assessment grants provide funding to inventory, characterize, assess, and conduct planning and community involvement activities related to brownfields. Brownfield revolving-loan fund grantees can capitalize a revolving loan and make subgrants to carry out cleanup activities. Cleanup grants, newly authorized by the Brownfields Law, will fund cleanup activities by grant recipients. Expanded authorities within the new law also address the potential for limited funding for institutional controls,

insurance, and health monitoring. EPA will provide limited funding for grants that provide technical assistance, training, and research to brownfield communities. We will also provide funding to create local environmental job training programs, ensuring that the economic benefits derived from brownfield revitalization efforts remain in the community.

EPA will continue to work in partnership with state cleanup programs to address brownfield properties. We will provide states and tribes with tools, information, and funding they can use to develop response programs for sites contaminated with hazardous wastes and petroleum. The Agency will continue to encourage the empowerment of state, tribal, and local officials to oversee brownfield activities and the implementation of local solutions to local problems.

### **Reducing Transboundary Threats Along the U.S.-Mexico Border**

EPA is working along the U.S.-Mexico Border to reduce transboundary threats to human and ecosystem health in North America. The U.S.-Mexico Border 2012 Program, a joint effort between the U.S. and Mexican governments, will work with the 10 border states and with border communities to improve the region's environmental health.<sup>21</sup>

Border communities face unique challenges in addressing environmental problems and coordinating efforts. To promote coordination, a number of regional workgroups and policy forums will collaborate with local communities to set priorities and plan and implement projects. These groups will also assist in establishing objectives, defining indicators, and measuring progress. The United States and Mexico will work to improve water quality along their border through a range of pollution control sanitation projects; our goal is to restore the quality of at least half of the currently impaired significant shared and transboundary surface waters by 2012.

Inadequate water and sewage treatment cause border residents to suffer disproportionately from hepatitis A and other waterborne diseases. Increasing the number of connections to safe drinking water systems and the number of homes with access to basic sanitation will reduce health risks to residents. Our planned assessment of transboundary surface waters will facilitate the development of environmental data essential for effective water management. To achieve Border 2012's goal of increasing by 25 percent the number of homes with access to safe drinking water and wastewater treatment systems, we are working with Mexican officials to determine the number of homes currently lacking access to these basic sanitation services.

In addition to water issues, EPA will focus on the environmental and human health risks posed by pesticides. By training migrant farm workers and others who routinely handle pesticides, we will reduce both the long-term chronic health effects of pesticide exposure as well as the incidence of acute pesticide poisoning.

**Objective 4.3: Ecosystems.** Protect, sustain, and restore the health of natural habitats and ecosystems.

**Sub-objective 4.3.1: Protect and Restore Ecosystems.** Facilitate the ecosystem-scale protection and restoration of natural areas.

Strategic Targets:

- ▼ By 2008, improve the overall aquatic system health of the 28 estuaries that are part of the National Estuary Program (NEP) compared to 2006, as measured using the National Coastal Condition Report and NEP indicators. (Baseline to be determined in 2006)
- ▼ By 2008, working with NEP partners, protect or restore an additional 250,000 acres of habitat within the study areas for the 28 estuaries that are part of the NEP. (2002 Baseline: 0 acres of habitat restored)

**Sub-objective 4.3.2: Increase Wetlands.** By 2008, working with partners, achieve a net increase of 400,000 acres of wetlands with additional focus on biological and functional measures. (2002 Baseline: annual net loss of an estimated 58,500 acres.)

Strategic Targets:

- ▼ Annually, beginning in FY 2004, work with the U.S. Army Corps of Engineers (COE) and other partners to achieve no net loss of wetlands under Section 404 of the Clean Water Act regulatory program.
- ▼ By 2006 and each year thereafter, work with COE and other partners to obtain no net loss in wetland function based on quantifying functions gained and lost through mitigation for authorized wetlands impacts.

**Sub-objective 4.3.3: Improve the Health of Great Lakes Ecosystems.** By 2008, prevent water pollution and improve the overall aquatic ecosystem health of the Great Lakes by at least 2 points. (2002 Baseline: Great Lakes rating of 20 on a 40-point scale, where the rating uses select Great Lakes State of the Lakes Ecosystem indicators, based on a 1 to 5 rating system for each indicator in which 1 is poor and 5 is good.)

Strategic Targets:

- ▼ By 2007, the average concentrations of PCBs in whole lake trout and walleye samples will decline by 25 percent. (2000 Baseline: concentration for Lake Superior of 0.9 ug/g; for Lake Huron, 0.8 ug/g; for Lake Michigan, 1.6 ug/g; for Lake Erie, 1.8 ug/g; and for Lake Ontario, 1.2 ug/g.)
- ▼ By 2008, the annual concentrations of toxic chemicals in the air in the Great Lakes basin will decline by 30 percent. (2002 Baseline: concentration for Lake Superior of 60 pg/m<sup>3</sup>; for Lake Huron, 19 pg/m<sup>3</sup>; for Lake Michigan, 87 pg/m<sup>3</sup>; for Lake Erie, 183 pg/m<sup>3</sup>; and for Lake Ontario, 36 pg/m<sup>3</sup>.)
- ▼ By 2010, restore and delist a cumulative total of at least 10 Areas of Concern within the Great Lakes basin. (2002 Baseline: 0 Areas of Concern restored)
- ▼ By 2008, a cumulative total of at least 3.3 million cubic yards of contaminated sediment in the Great Lakes will be remediated. (2002 Baseline: 2.1 million cubic yards of contaminated sediments from the Great Lakes have been remediated from 1997 through 2001.)

**Sub-objective 4.3.4: Improve the Aquatic Health of the Chesapeake Bay.** By 2008, prevent water pollution and improve the overall aquatic ecosystem health of the Chesapeake Bay so that there are 120,000 acres of submerged aquatic vegetation. (2002 Baseline: 85,252 acres.)

Strategic Targets:

- ▼ By 2008, reduce nitrogen loads entering Chesapeake Bay by 94 million pounds per year, from 1985 levels. (2002 Baseline: 51 million pounds per year reduced.)
- ▼ By 2008, reduce phosphorus loads entering Chesapeake Bay by 9.7 million pounds per year, from 1985 levels. (2002 Baseline: 8 million pounds per year reduced.)
- ▼ By 2008, reduce sediment loads entering Chesapeake Bay by 1.37 million tons per year, from 1985 levels. (2002 Baseline: 0.8 million tons per year reduced.)

**Sub-objective 4.3.5: Improve the Aquatic Health of the Gulf of Mexico.** Prevent water

pollution and protect aquatic systems in order to improve the overall health of the Gulf of Mexico.

Strategic Targets:

- ▼ By 2008, prevent water pollution and improve the overall aquatic ecosystem health of coastal waters of the Gulf of Mexico by 0.2 on the “good/fair/poor” scale of the National Coastal Condition Report. (2002 Baseline: southeast rating of fair/poor or 1.9 where the rating is based on a 5-point system in which 1 is poor and 5 is good and is expressed as an areal-weighted mean of regional scores using the National Coastal Condition Report indicators addressing water clarity, dissolved oxygen, coastal wetland loss, eutrophic conditions, sediment contamination, benthic health, and fish tissue contamination.)
- ▼ By 2015, reduce releases of nutrients throughout the Mississippi River Basin to reduce the size of the hypoxic zone in the Gulf of Mexico to less than 5,000 km<sup>2</sup>, as measured by the 5-year running average of the size of the zone. (Baseline: 1996-2000 running average size is 14,128 km<sup>2</sup>.)

### **Means and Strategies for Achieving Objective 4.3**

EPA is working to protect, sustain, and restore the health of natural habitats and ecosystems by identifying and evaluating problem areas, developing tools, and improving community capacity to address problems. Some activities will continue to be targeted to such high-priority areas as Long Island Sound, Lake Champlain, Lake Pontchartrain, and South Florida. Targeted watershed grants that provide tools, training, and technical assistance will support community efforts to expand and improve existing watershed protection measures. These various place-based ecosystem protection efforts provide an opportunity to increase federal involvement in critical watersheds and to develop and implement water quality control practices and other ecosystem management tools that can be transferred to other place-based efforts nationwide.

### **Protecting and Restoring Ecosystems: The National Estuaries Program**

Estuaries are among the most productive ecosystems on Earth, providing numerous ecological, economic, cultural, and aesthetic benefits and services. They are also among the most threatened ecosystems, largely as a result of rapidly increasing growth and development. About half of the U.S. population now lives in coastal areas, and coastal counties are growing three times faster than counties elsewhere in the Nation.<sup>22</sup> Overuse of resources and poor land use practices have resulted in a host of

human health and natural resource problems.

EPA plans to implement key activities under the NEP to help address these growing threats to the Nation's estuarine resources.<sup>23</sup> The NEP, which provides inclusive, community-based planning and action at the watershed level, is an important initiative in conserving our estuarine resources. We will facilitate the ecosystem-scale protection and restoration of natural areas by supporting continuing efforts of all 28 NEP estuaries to implement their Comprehensive Conservation and Management Plans to protect and restore estuarine resources. In addition, EPA will provide more focused support for several priority needs the NEP has identified, including problems of invasive species; air deposition of pollutants, such as mercury and nitrogen; and nutrient overenrichment. EPA will support the NEP in developing monitoring protocols for aquatic nuisance species and rapid response plans, expanding mercury deposition monitoring, and developing and implementing nutrient management strategies.

The health of the Nation's estuarine ecosystems also depends on the maintenance of high-quality habitat. Diminished and degraded habitats are less able to support healthy populations of wildlife and marine organisms and perform the economic, environmental, and aesthetic functions on which coastal populations depend for their livelihood.

### **Increasing Wetlands**

Over the years, the United States has lost more than 115 million acres of wetlands to development, agriculture, and other uses.<sup>24</sup> Today, the Nation loses an estimated 58,000 acres of wetlands every year, and other wetlands are being degraded by excessive sedimentation, nutrient overenrichment, pesticides, invasive species, habitat loss, and fragmentation.<sup>25</sup>

The Administration is committed to a regulatory program aimed at no net loss of wetlands and to initiatives and partnerships to improve their overall condition. In December 2002, COE, in cooperation with EPA, issued a Regulatory Guidance Letter to improve wetland protection through better compensatory mitigation. Also, the Administration unveiled a National Wetlands Mitigation Action Plan<sup>26</sup> listing 17 action items that federal agencies will undertake to improve the effectiveness of wetland mitigation and restoration.

EPA will work with its state and tribal partners to develop and implement broad-based, integrated monitoring and assessment programs for wetlands that strengthen water quality standards, improve decisionmaking, target restoration within the watershed, address significant stressors, and report on condition. EPA will work for national gains in wetland acreage by implementing an innovative and partner-based wetlands and stream corridor restoration program. Working with states, COE, and other partners, we will build our capacity to measure wetland function and condition, as well as wetland acreage. The Agency will assist its federal, state, and tribal partners in building capacity to implement

more effective wetland programs, including those that protect wetlands and waters not covered by the Clean Water Act. EPA's support will help avoid or minimize wetland losses and provide for full compensation for unavoidable losses of wetland functions. We will continue to focus on wetlands and stream corridor restoration to regain lost aquatic resources.

### **Improving the Aquatic Health of the Great Lakes Ecosystem**

The Great Lakes are the largest system of surface freshwater on Earth, containing 20 percent of the world's surface freshwater and accounting for more than 90 percent of the surface freshwater in the United States. The watershed includes two nations, eight American states, a Canadian province, more than forty tribes and is home to more than one-tenth of the U.S. population. To further restore the chemical, physical, and biological integrity of the Great Lakes ecosystem, EPA is implementing Clean Water Act core water protection programs and has launched the Great Lakes Strategy 2002: A Plan for the New Millennium, on behalf of the U.S. Policy Committee.<sup>27</sup> The strategy presents a basin-wide vision for Great Lakes protection and restoration, identifying the major environmental issues in the Great Lakes; establishing common goals for federal, state, and tribal agencies; and helping to fulfill U.S. responsibilities under the U.S.-Canada Great Lakes Water Quality Agreement.<sup>28</sup>

The Great Lakes Strategy incorporates the Great Lakes Binational Toxics Strategy, a groundbreaking international toxics reduction effort that targets a common set of persistent, toxic substances for reduction and elimination.<sup>29</sup> The Toxics Strategy applies voluntary and regulatory tools focused on pollution prevention to a targeted set of substances, including mercury, PCBs, dioxins/furans, and certain canceled pesticides. The strategy outlines activities for states, industry, tribes, nongovernmental organizations, and other stakeholders.

These efforts will be reinforced by the Great Lakes Legacy Act, which targets additional resources to clean up contaminated sediments. Sediment contamination is a significant source of Great Lakes toxic pollutants and can threaten human health via the bioaccumulation of toxic substances through the food chain.

### **Improving the Aquatic Health of the Chesapeake Bay Ecosystem**

EPA's Chesapeake Bay work is based on a unique regional partnership formed to direct and conduct restoration of the bay. Partners include Maryland, Virginia, and Pennsylvania; the District of Columbia; the Chesapeake Bay Commission, a tri-state legislative body; EPA, which represents the federal government; and participating citizen advisory groups. Chesapeake 2000, a comprehensive and far-reaching agreement, will guide restoration and protection efforts through



2010 and will focus on improving water quality as the most critical element in the overall protection and restoration of the bay and its tributaries.<sup>30</sup>

One of the key measures of success in achieving improved bay water quality will be the restoration of submerged aquatic vegetation (SAV). SAV produces oxygen; nourishes a variety of animals; provides shelter and nursery areas for fish and shellfish; reduces wave action and shoreline erosion; absorbs nutrients, such as phosphorus and nitrogen; and traps sediments. While recent improvements in water quality have contributed to a resurgence in SAV (from a low of 38,000 acres in 1984 to more than 85,000 acres today<sup>31</sup>), more improvements are needed.

To achieve improved water quality and restore SAV, partners have committed to reducing nutrient and sediment pollution loads sufficiently to remove the bay and the tidal portions of its tributaries from the list of impaired waters. Key elements of state strategies to achieve these reductions include implementing advanced treatment of wastewater to reduce nutrient discharges, a range of management practices to reduce nutrients and sediments from farms, and the restoration and protection of riparian forests that serve as a buffer against sediment and nutrient pollution that enters waterways from the land.

### **Improving the Aquatic Health of Gulf of Mexico Ecosystem**

EPA's efforts in the Gulf of Mexico represent a broad, multi-organizational partnership. EPA, Gulf states, and stakeholders are developing a regional, ecosystem, and watershed-based framework for restoring and protecting the Gulf of Mexico in ways consistent with the economic well-being of the region. Partners voluntarily identify key environmental problems and work at the regional, state, and local levels to define and recommend solutions.

Gulf of Mexico issues can be broadly categorized as affecting water quality, public health, and habitat loss. The first step in restoring and protecting the biological integrity of the waters and important habitats of the Gulf of Mexico is to restore the full aquatic life and recreational uses (including safe consumption of seafood) of high-priority coastal watersheds and estuaries, including the watersheds of the Mississippi River Basin. Continued implementation of EPA's core Clean Water Act water protection programs<sup>32</sup> and efforts to address the hypoxic zone will help to restore the waters of the Gulf and its tributaries. Restoring aquatic life and recreational uses will directly benefit communities as well.

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**Objective 4.4: Enhance Science and Research.** Through 2008, provide a sound scientific foundation for EPA's goal of protecting, sustaining, and restoring the health of people, communities, and ecosystems by conducting leading-edge research and developing a better understanding and characterization of environmental outcomes under Goal 4.

**Sub-objective 4.4.1: Apply the Best Available Science.** Through 2008, identify and synthesize the best available scientific information, models, methods and analyses to support Agency guidance and policy decisions related to the health of people, communities, and ecosystems.

**Sub-objective 4.4.2: Conduct Relevant Research.** Through 2008, conduct research that contributes to the overall health of people, communities, and ecosystems. Focus research on pesticides and toxics; global climate change; homeland security; and comprehensive, cross-cutting studies of human, community, and ecosystem health.

## **Means and Strategies for Achieving Objective 4.4**

### **Providing the Best Available Science**

Protecting, sustaining, and restoring the health of people, communities, and ecosystems requires the commitment and coordination of a number of EPA programs; brings together expertise and resources from across the Agency; and cultivates relationships with our external partners and stakeholders. To meet this goal, EPA must use the best available science and apply its findings effectively to make sound decisions and meet a broad range of program needs.

#### Environmental Indicators

Environmental indicators are an important tool for analyzing and communicating information about environmental conditions and human health. EPA will continue to implement the Environmental Indicators Initiative to establish a set of performance indicators that measure environmental status.

For environmental indicators to signal change effectively, they must be scientifically valid for answering environmental questions from many perspectives. In many cases, one environmental indicator may not be sufficient to address local, state, regional, or national questions. Therefore, as explained in our 2003 *Draft Report on the Environment*, EPA and its partners must select environmental indicators carefully.

To adequately report on environmental conditions, by 2008 EPA will work with other federal agencies to develop scientifically valid environmental indicators that reflect national, regional, and state interests and address six ecological attributes: landscape condition, biotic condition, chemical and physical characteristics, ecological processes, hydrology/geomorphology, and natural disturbances regimes. In addition, based on sound science, EPA regions and states will identify ecosystems with

highest priority for protection and restoration.

### Geospatial Tools and Public Access

In coordination with other federal agencies, we will develop new geospatial tools and information that will allow EPA and its partners to assess ecosystem conditions holistically. This approach will indicate where environmental stressors are located and will enable us to develop more comprehensive natural resource and environmental programs to improve ecosystem health.

EPA's regional offices will continue to improve their ability to identify baseline community and ecosystem health conditions in priority geographic areas. The Agency will continue to assess the status and trends of ecosystem health and develop community and ecosystem indicators.

We will continue to ensure that high-quality environmental data are used to make sound environmental decisions by conducting laboratory evaluations and investigations, data validations, quality assurance management and project plan reviews, and geographic information system analyses and by managing regional quality assurance programs and analytical services/support contracts. State and tribal organizations that receive EPA funds will provide quality management plans for EPA review and approval. EPA regional offices will continue to provide environmental monitoring and technical assistance to federal, state, tribal, and local agencies to assist them in evaluating and addressing problem facilities and priority geographic areas. We will continue working to improve public access to environmental information that we, our partners, and our stakeholders collect.

### Endocrine Disruptors

Over the last several years, concern has grown about exposure to endocrine-disrupting, or hormonally active, chemicals. Evidence suggests that exposure to chemicals that mimic hormones (endocrine disruptors) may cause adverse health effects in wildlife and may affect human health as well.<sup>33</sup> EPA is working to reduce uncertainty in our knowledge of endocrine disruptors, determine chemicals' potential for endocrine disruption, and identify the nature of adverse effects.

The Agency needs valid tests to assess new chemicals' and pesticides' potential for endocrine disruption. We will complete validation of screens and tests that are necessary before large-scale reviews can take place, and a Federal Advisory Subcommittee will continue to provide EPA with scientific and technical advice. We are working to minimize the use of animals for these tests.

### Regional Laboratories

Through its regional offices, EPA will participate in the National Environmental Laboratory

Accreditation Conference (NELAC), an association of state and federal agencies and private organizations formed to establish and promote mutually acceptable performance standards for the inspection and operation of environmental laboratories. We will support implementation of the NELAC standards to ensure that decisions are made from a sound technical, scientific, and statistical basis and that laboratories deliver quality data. EPA will also update its own outdated laboratory equipment to increase our investigative, monitoring, and analytical capabilities.

## **Conducting Research**

To enable us to meet our regulatory and policy objectives for healthy people, communities, and ecosystems, EPA's Office of Research and Development has developed multi-year plans for research on safe food, pesticides, and toxics; global change; ecological assessment; human health; endocrine disruptors; and mercury. These plans lay out long-term research goals for the next 5 to 10 years and annual milestones needed to achieve these goals.<sup>34</sup> In addition, we will conduct research on computational toxicology and PBT pollutants.

### Safer Food, Pesticides, and Chemical Products

The Safe Food Research Program, developed in response to FQPA, builds on earlier research to reduce scientific uncertainty in risk assessment. Research will provide data needed to develop refined aggregate and cumulative risk assessments, develop appropriate safety factors to protect children and other sensitive populations, refine risk assessments, and provide risk mitigation technologies to reduce risks to humans. By 2008, EPA will provide scientific tools that can be used to characterize, assess, and manage risks addressed under FQPA.

Additional research on pesticides and toxics provides results that support the Federal Insecticide, Fungicide, and Rodenticide Act and TSCA. EPA's multi-year plans for safe pesticides/safe products outline research designed to enhance the Agency's human health and ecological risk assessment and risk management capabilities and includes the development of predictive tools used in testing requirements, research on probabilistic risk assessment methods, biotechnology, and other areas of high interest and utility to the Agency's pesticide, pollution prevention, and toxic substances programs.

### Global Change

The Global Change Research Act of 1990 establishes a coordinated, comprehensive, interagency research program on global change, in which EPA participates. In conducting research and analysis on the potential impacts of global climate change, EPA will make certain that our work is coordinated and consistent with the Climate Change Science Program (CCSP) *Strategic Plan* that

was released on July 24, 2003. Further, we will collaborate closely with the CCSP Director (who also serves as the Deputy Administrator of the National Oceanographic and Atmospheric Agency) to assist in ensuring appropriate prioritization, efficiency, avoidance of duplication, and a consistently high standard of scientific review for all aspects of supported studies and analyses across the federal government.

### Ecosystem Protection

Global change, loss and destruction of habitat due to sprawl and exploitation of natural resources, invasive species, nonpoint source pollution, and the accumulation and interaction of these effects present emerging ecological problems. EPA will conduct research to strengthen our ability to assess and compare risks to ecosystems, to protect and restore them, and to track progress in terms of ecological outcomes. For example, as part of our long-term research goals, we will work to provide environmental managers and researchers with a better understanding of the links between human activities, natural dynamics, ecological stressors, and ecosystem conditions; with tools they can use to predict stressors on ecological resources; and with scientifically defensible methods for protecting and restoring ecosystem conditions.

### Human Health

EPA's human health research represents the Agency's only comprehensive program to address the limitations in human health risk assessment. Scientists across the Agency will use the measurement-derived databases, models, and protocols developed through this research program to strengthen the scientific foundation for human health risk assessment. EPA's human health research will focus on a unified risk assessment approach that incorporates biological modes of toxicity, aggregate and cumulative exposures, susceptible subpopulations, and evaluations of public health outcomes resulting from risk management actions.

### Endocrine Disruptors

To support our regulatory mandates, EPA's research will focus on improving our scientific understanding of exposures to, effects from, and management of endocrine-disruptor chemicals and advancing our screening and testing program. We will also conduct research to determine the extent of the impact that endocrine-disrupting chemicals may have on humans, wildlife, and the environment.

### Mercury

A 1997 *EPA Mercury Study Report to Congress* discussed the magnitude of mercury emissions in the United States and concluded that a plausible link exists between human activities that

release mercury from industrial and combustion sources in the United States and methylmercury concentrations in humans and wildlife. Regulatory mandates require EPA to address these risks. The Agency's risk management research will address managing emissions from coal-fired utilities (critical information for rule-making) and noncombustion sources of mercury; the fate and transport of mercury to fish; regionally-based ecological assessments of the effects of methylmercury on birds; assessing methylmercury in human populations; and developing risk communication methods and tools.

#### Persistent, Bioaccumulative Toxic Pollutants (PBTs)

EPA is developing a strategy for identifying and reducing risks to humans and the environment posed by current and future exposures to priority PBT chemicals. Our research will help us establish action priorities for a select list of PBT pollutants; screen and select additional priority PBT pollutants for action; and develop a cross-cutting PBT routine monitoring strategy.

#### Computational Toxicology

To enhance the scientific basis and diagnostic/predictive capabilities of existing and proposed chemical testing programs, EPA will use *in vitro* tests (carried out in test tubes or artificial environments instead of in living organisms) or such other approaches as molecular profiling, bioinformatics, and quantitative structure-activity relationships. The term "computational toxicology" refers to using these alternative approaches in conjunction with highly sophisticated computer-based models. Computational toxicology is expected to greatly reduce the use of animal testing to obtain chemical toxicity information.

#### Homeland Security

In pursuing our mission to protect human health and safeguard the environment, EPA has developed unique scientific and technical expertise and possesses capabilities that complement other federal agencies' homeland security efforts. As a key agency charged with crisis and consequence management responsibilities under the National Strategy for Homeland Security, EPA must be ready to deploy its expertise to help detect, prevent, protect against, respond to, and recover from a terrorist act against the United States. To meet this responsibility, EPA will perform a number of functions.

EPA will continue to identify and evaluate biological agents that terrorists may use as weapons against the United States. We have begun to conduct scientific assessments and develop test protocols to determine the efficacy and safety of products that can be used against these potential biological threats and to develop detection and decontamination processes. To provide added protection, we will work to educate our partners and the public about these pesticides, strengthen the certification and training program, and improve storage and disposal procedures.

To support homeland security, EPA conducts research in three main areas: building decontamination, water security, and rapid risk assessment.

- ▼ Research on decontamination of buildings will focus on methods and technologies for (1) preventing, detecting, and containing biological and chemical agents intentionally introduced into large buildings or structures; (2) decontaminating building surfaces and content; and (3) safely disposing of residual materials. This work will result in more efficient and effective cleanup of contaminated buildings and prevention measures.
- ▼ Water security research will focus on enhanced methods for preventing, detecting, treating, and containing biological and chemical agents intentionally introduced into drinking-water and wastewater systems.
- ▼ Rapid risk assessment research will focus on developing practices and procedures that provide elected officials, decision-makers, the public, and first responders with rapid risk assessment protocols for chemical and biological threats. For more efficient emergency response, EPA will also inventory the Agency's, the federal government's, and the private sector's expertise to provide quick access to nationally recognized, highly specialized experts in such homeland security areas as biology, chemistry, exposure assessment, and detection and treatment technologies.

EPA will also provide technical expertise to federal, state, and local governments and to other institutions. We will use customized situational analysis tools for emergency management that deliver secure, reliable, and timely data access and communications to on-scene coordinators, emergency response teams, and field investigators.

## EXTERNAL FACTORS

EPA's ability to achieve its strategic objectives depends on many factors over which the Agency has only partial control or little or no influence. Partnerships, voluntary cooperation, international collaboration, global harmonization, industry, economic influences, industrial accidents, natural disasters, litigation, and legislation play critical roles, affecting the Agency's results. Changes in the focus, level of effort, or status of any of these components could affect the success of the Agency's programs under Goal 4. Consequently, EPA must consider these factors as it establishes annual performance measures and targets.

### Leveraging Partnerships

EPA depends on its partnerships with other federal agencies, states, tribes, local governments, and regulated parties to achieve results. We use information from a variety of federal, state, and international organizations and agencies to protect our health and our environment from hazardous or higher-risk pesticides and toxics. We rely especially on states as co-implementors of our Nation's environmental protection programs.

The Brownfields Program, which partners EPA with more than 21 agencies and departments as well as with local communities, exemplifies the effectiveness of the collaborative approach. Although federal and state programs may be in place to address the difficult issues communities face, too often the programs operate in isolation. Successfully bringing to bear the diverse expertise and experience offered by collaborating agencies will help make federal efforts more effective. Similarly, local action is key to the success of EPA's lead program, which depends on our state partners to encourage homeowners to correct lead-based hazards in their homes. The lead program also depends on schools and parents to screen children for high blood levels of lead. Disrupting these partnerships will significantly compromise our ability to achieve our risk reduction goals.

EPA often relies on such agencies as the U.S. Department of Health and Human Services, USDA, the U.S. Department of Housing and Urban Development (HUD), COE, and USFWS to carry out aspects of environmental protection programs. The success of EPA's lead program, for example, partly depends on HUD's ability to renovate the Nation's public housing. Annual or biannual tracking of wetlands inventory information will depend upon the ability of USFWS and/or USDA to deliver national wetlands inventory information more frequently. Similarly, USDA's successful implementation of the Farm Bill's wetlands provisions is critical for reducing wetland losses in rural areas.

As we rely on other federal agencies and our state and local government partners, EPA's pesticide programs depend, in part, on the voluntary cooperation of the private sector and the public. Farmers favor broad-spectrum pesticides that are cheaper and easier to apply. While EPA reviews pesticides to ensure that they meet the current health and safety standards, we have limited influence in the adoption of registered pesticides. Thus once a pesticide is registered, it is difficult to predict how extensively it will be used.

#### International Cooperation

International collaboration, guideline harmonization, information sharing, and building other nations' capacity to reduce risk also contribute to achieving our risk reduction goals. For example, it will be essential for both the United States and Mexico to invest the necessary resources to achieve the goals of the Border 2012 binational effort and to collect the data needed to measure progress.

Continued ecological improvement in the Great Lakes will rely on local, state, federal, and the



Canadian government's participation in the Great Lakes Strategy under the Great Lakes Water Quality Agreement. Until invasive species can be prevented from entering the Great Lakes through cargo ships, they will likely continue to impede the achievement of Great Lakes ecosystem goals.

#### Industry Response

Progress in reducing risks is often highly dependent on industry's response to EPA assistance and initiatives. EPA has no direct control over the pace and volume at which industry develops new chemicals or pesticides; we primarily concentrate on providing industry with tools, such as the PBT Profiler and Pollution Prevention Framework, or incentives, such as the priority review of reduced-risk pesticides, to help screen out high-risk chemicals before they are submitted for EPA review. Voluntary programs, such as the HPV Challenge Program, operate exclusively on the basis of industry commitments for participation. If industry fails to respond to such initiatives, the Agency will be less able to achieve effective new chemical screening efficiently.

#### Economic and Technological Change

Economic growth and changes in producer and consumer behavior could also influence the Agency's ability to achieve its objectives over the coming years. New technology or unanticipated complexity or magnitude of pollution problems could delay our progress. Economic conditions will affect EPA's ability to achieve its brownfields objectives, since the ability of grant recipients to leverage needed cleanup and redevelopment funding and to create jobs depends on economic conditions external to EPA.

Finally, large-scale accidental releases, such as chemical spills, or rare catastrophic natural events, such as hurricanes or large-scale flooding, could hinder our ability to achieve objectives in the short term. Newly identified environmental problems and priorities could have a similar effect on long-term goals. For example, pesticide use may be affected by unanticipated pest infestations or disease factors, which would require EPA to review emergency uses to avoid unreasonable risks to health or the environment.

### **Human Capital Focus For Achieving Goal 4**

EPA will require staff with very specialized technical and coalition-building expertise:

- Developmental and molecular biologists, toxicologists, modelers, engineers, chemists, and statisticians to develop methodologies, data, models, risk-assessment guidance, and toxicity testing methods and protocols
- Land-use attorneys, public health experts, and other professionals with experience at the local level in land-use planning, geographic information systems, and facilitation
- Chemical engineers with experience at industrial facilities
- Professionals with communication, facilitation, and consensus-building skills.

### **Efficiency Measures For Goal 4**

Efficiency measures relate results to the resources or time invested to achieve those results and augment effectiveness measures in evaluating performance. They help us integrate EPA's budget and performance—part of the President's Management Agenda—and demonstrate the cost-effectiveness and timeliness of program activities.

Among the strategic targets in this goal are three efficiency measures, including one that targets a reduction in the length of time EPA requires to make registration decisions for conventional and new reduced-risk pesticide active ingredients:

*By 2008, reduce registration decision times by 10 percent for conventional new active ingredients and 5 percent for reduced-risk new active ingredients from the 1995-2002 baseline of 40 months for conventional new active ingredients and 24 months for reduced-risk conventional new active ingredients.*

## Notes

1. Source citation for Mexico: Food and Agriculture Organization, Rome 2001.
2. "Acre treatments" relate the use of a pesticide to the number of acres treated and the number of treatments applied. For example, treating 50 acres of a crop with a pesticide, then applying it a second time later in the growing season, yields 100 acre treatments. Considering pesticide use in terms of acre treatment provides a better sense of exposure levels.
3. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics. *OECD SIDS Manual Sections 3.4 and 3.5*. Washington, DC. Available online at: <http://www.epa.gov/chemrtk/sidsappb.htm>; High Production Volume (HPV) Challenge Program. Accessed August 28, 2003.  
  
Organisation for Economic Co-operation and Development (OECD). April 2003. *Manual for Investigation of HPV Chemicals (SIDS Manual)*. Paris, France. Available on the Internet at: <http://www.oecd.org> and enter "HPV Chemicals" at the search window. Accessed September 9, 2003.
4. Under Section 5 of TSCA, EPA is mandated to determine whether "the manufacture, processing, distribution in commerce, use, or disposal of a 'new' chemical substance or any combination of such activities presents or may present an unreasonable risk of injury to health or the environment." Methods for determining unreasonable risk under TSCA Section 5 are contained in an internal document that is not currently made available to the public. Information from: U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics. New Chemicals Program: TSCA 5(e) Exposure-Based Policy: Criteria Web Site. Available online at: <http://www.epa.gov/oppt/newchemicals/expbased.htm>. Accessed September 9, 2003.
5. Investigations are underway for baseline development by an internal EPA New Chemicals Program Performance workgroup. Results are expected by January 2004 and may be available in the FY 2005 Annual Performance Plan to Congress submitted in late January 2004.
6. U.S. Environmental Protection Agency. February 2004. *FY 2005 Annual Performance Plan Verification and Validation of Annual Performance Measures*. Washington, DC: Government Printing Office.
7. Centers for Disease Control, National Center for Health Statistics. *National Health and Nutrition Examination Survey: 1999–2002*. Available online at <http://www.cdc.gov/nchs/nhanes.htm>.  
  
*Morbidity and Mortality Weekly Report*. Volume 49, Number 50, page 1133. December 22, 2000. To order a copy, visit <http://www.cdc.gov/mmwr/>.  
  
*Blood Lead Levels in Young Children--United States and Selected States, 1996-1999*. December 22, 2000. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Date of access: September 24, 2003.  
  
U.S. Environmental Protection Agency. February 2004. *FY 2005 Annual Performance Plan Verification and Validation of Annual Performance Measures*. Washington, DC: Government Printing Office.

8.U.S. Environmental Protection Agency. February 2004. *FY 2005 Annual Performance Plan Verification and Validation of Annual Performance Measures*. Washington, DC: Government Printing Office.

40 CFR 761.180(a) requires storers and disposers of PCB waste to submit an annual report to their respective regional offices. The annual report is based on a calendar year but is not required until the following July resulting in a delay in generation of the trend summary. The regions send summaries of annual report data to Headquarters for generation of an annual report summary. These data provide PCB disposal trends. Current information for the last 3 years (1999-2001) indicate a downward trend in PCB disposal.

9.Arctic Monitoring and Assessment Programme (AMAP Report 2000.3), *PCBs in the Russian Federation: Inventory and Proposals for Priority Remedial Actions*, p.7-8, 23, Center for International Projects, Moscow, 2000.

10.U.S. Environmental Protection Agency, Office of Pesticide Programs. December 1999, *Biennial Report, FY 1998/1999*. EPA 735-R-99-02. Washington, DC.

11.Federal Food, Drug and Cosmetic Act (FFDCA), as amended by Food Quality Protection Act (FQPA), Sec 408(a)(2)(B).

12.Toxic Substances Control Act Section 5: Manufacturing and Processing Notices, *Public Law* 94-469, October 11, 1976.

13. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics. PBT Profiler Web Site, <http://www.PBTProfiler.net>. Washington, DC. Accessed September 3, 2003.

U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics. Pollution Prevention (P2) Framework Web Site, <http://www.epa.gov/oppt/p2framework/>. Washington, DC. Accessed September 9, 2003.

U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics. January 2003. *Pollution Prevention (P2) Framework*. EPA-748-B-03-001. Washington, DC: Government Printing Office.

14.67 *Federal Register* 76282. December 11, 2002. "Sustainable Futures" U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics. Pollution Prevention (P2) Framework Web Site, <http://www.epa.gov/oppt/p2framework/>. Washington, DC. Accessed September 9, 2003.

15. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics. "High Production Volume (HPV) Challenge Program." Available online at: <http://www.epa.gov/chemrtk/volchall.htm>. Washington, DC. Accessed September 9, 2003.

"Data Collection and Development on High Production Volume (HPV) Chemicals." EPA OPPTS-42213; AR-201; FRL-6754-6. Available online at: <http://www.epa.gov/chemrtk/ts42213.htm>.

16.National Research Council. 2001. *Standing Operation Procedures for Developing Acute Exposure Guideline Levels for Hazardous Chemicals*. Washington, DC: National Academy Press.

17. Centers for Disease Control, National Center for Health Statistics. 2003. *National Health and Nutrition Examination Survey: 1999-2002*. Available online at <http://www.cdc.gov/nchs/nhanes/htm> or at <http://www.cdc.gov/nchs/about/major/nhanes/datalink.htm#1999> Current NHANES. Washington, DC. Date of access: September 24, 2003.
18. Octel: 1998. *Octel Worldwide Gasoline and Diesel Fuel Survey*.
19. U.S. Environmental Protection Agency/U.S. Agency for International Development. Publication 160-B-99-001.
20. Public Law 107-118. "Small Business Liability Relief and Brownfields Revitalization Act," 2002.
21. U.S. Environmental Protection Agency, U.S.-Mexico Border Program, Border 2012 Program Web Site, <http://www.epa.gov.usmexicoborder/>.
22. Beach, Dana. 2002. *Coastal Sprawl: The Effects of Urban Design on Aquatic Ecosystems in the United States*. Arlington, VA: Pew Oceans Commission. Available online at: [http://www.pewoceans.org/reports/water\\_pollution\\_sprawl.pdf](http://www.pewoceans.org/reports/water_pollution_sprawl.pdf).
23. The means and strategies outlined here for achieving Sub-objective 4.3.1 must be viewed in tandem with the means and strategies outlined under Goal 2, Objective 2, Sub-objective 2.2.2, "Improve Ocean and Coastal Waters." Sub-objective 2.2.2 contains strategic targets for EPA's vessel discharge, dredged material management, and ocean disposal programs, which are integral to the Agency's efforts to facilitating the ecosystem-scale protection and restoration of natural areas.
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32. EPA's water quality protection programs are discussed under Goal 2: Clean and Safe Water.
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34. U.S. Environmental Protection Agency, Office of Research and Development. Research Directions: Multi-Year Plans Web Site, <http://www.epa.gov/osp/myp.htm>.